

Patent claims

1. An optical transmission module having
 - an optical transmission element,
 - 5 - a driver which drives the transmission element and uses a transmission signal that is applied to its driver input to produce a drive signal for the transmission element,
 - a programmable control device which drives the
 - 10 driver, and
 - a multiplexing device, which is connected between a signal input of the transmission module, the driver input and the control device and by means of which an input signal that is applied to the
 - 15 signal input of the transmission module can be switched to the control device or to the driver.
2. The optical transmission module as claimed in claim 1,
 - 20 - wherein the multiplexing device has a control input via which a control signal can be fed into the multiplexing device, and
 - wherein the multiplexing device is designed such that it can be switched by means of the control
 - 25 signal from a switching state in which the signal input of the transmission module and the control device are connected to a switching state in which the signal input of the transmission module and the driver input are connected, or vice versa.
- 30 3. The optical transmission module as claimed in claim 1,
 - wherein the multiplexing device is designed such that it determines whether the input signal that
 - 35 is applied to the signal input of the transmission module is a programming signal for the control device or a transmission signal for the driver, and

- wherein the multiplexing device switches the input signal automatically to the control device if the input signal is a programming signal, or switches it to the driver if the input signal is a transmission signal.
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- 4. The optical transmission module as claimed in claim 3,
 - wherein the multiplexing device has a monitoring module whose input side is connected directly or indirectly to the signal input of the transmission module and which identifies programming signals and transmission signals in each case,
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 - wherein the multiplexing device has a multiplexing unit which is driven by the monitoring module via a control connection and has at least one input, two outputs and said control connection,
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 - wherein the multiplexing unit is connected directly or indirectly on the input side to the signal input of the transmission module and on the output side to the driver input of the driver and to the control device, and
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 - wherein the multiplexing unit connects the signal input of the transmission module to the driver input of the driver or to the control device as a function of the control signals from the monitoring module.
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- 5. The optical transmission module as claimed in claim 4, wherein a line terminating impedance is arranged between the multiplexing unit and the signal input of the transmission module.
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- 6. The optical transmission module as claimed in claim 5, wherein the impedance of the line terminating impedance is controllable.
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- 7. The optical transmission module as claimed in

claim 6, wherein the line terminating impedance has an impedance control input which is connected to the monitoring module.

5 8. The optical transmission module as claimed in claim 7, wherein the monitoring module sets the line terminating impedance

- to an impedance which is suitable for transmission signals when a transmission signal is applied to the signal input of the transmission module, and
- 10 - to an impedance which is suitable for a programming signal when a programming signal is applied to the signal input of the transmission module.

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9. The optical transmission module as claimed in claim 8, wherein

- the monitoring module switches the line terminating impedance to have a high impedance, or
- 20 disconnects it, when a programming signal is applied to the signal input of the transmission module.

10. The optical transmission module as claimed in claim 1,

- wherein the transmission module has a pattern generator, and
- wherein the multiplexing device is designed such that it connects the pattern generator to the driver when the signal input of the transmission
- 30 module is connected to the control device.

11. The optical transmission module as claimed in claim 10,

- 35 - wherein the multiplexing device has a control input via which a control signal can be fed into the multiplexing device, and
- wherein the multiplexing device is designed such

that it can be switched by means of the control signal from a switching state which connects the signal input from the transmission module and the control device to a switching state which connects the signal input of the transmission module and the driver input of the driver, or vice versa.

12. The optical transmission module as claimed in claim 10,

- 10 - wherein the multiplexing device is designed such that it determines whether the input signal that is applied to the signal input of the transmission module is a programming signal for the control device or is a transmission signal for the driver, and
- 15 - wherein the multiplexing device switches the input signal automatically to the control device if the input signal is a programming signal, and switches it to the driver if the input signal is a transmission signal.

13. The optical transmission module as claimed in claim 12,

- 25 - wherein the multiplexing device has a monitoring module whose input side is connected directly or indirectly to the signal input of the transmission module and which identifies programming signals and transmission signals,
- 30 - wherein the multiplexing device has a first multiplexing unit which is driven by the monitoring module via a control connection and has at least one input, two outputs and said control connection,
- 35 - wherein the first multiplexing unit is connected directly or indirectly on the input side to the signal input of the transmission module and on the output side to the driver input of the driver and to the control device, and

- wherein the first multiplexing unit connects the signal input of the transmission module to the driver input of the driver or to the control device as a function of the control signals from the monitoring module.

14. The optical transmission module as claimed in claim 13, wherein

- the multiplexing device has a second multiplexing unit with at least two signal inputs, one signal output and one control connection,
- one of the two signal inputs of the second multiplexing unit is connected directly or indirectly to that output of the first multiplexing unit which is associated with the driver,
- the other of the two signal inputs of the second multiplexing unit is connected directly or indirectly to the pattern generator,
- the signal output of the second multiplexing unit is connected directly or indirectly to the driver,
- the control connection of the second multiplexing unit is connected directly or indirectly to the monitoring module, and
- the monitoring module drives the second multiplexing unit such that the output signals from the pattern generator are passed to the driver if the signal input of the transmission module and control device are connected to the first multiplexing unit.

15. The optical transmission module as claimed in claim 3,

- wherein the multiplexing device has a level detector, by means of which it measures the signal level of the input signal at the signal input of the transmission module, and
- wherein the multiplexing device uses the signal

level for determine whether this is a transmission signal for the transmission device or a programming signal for the control device.

5 16. The optical transmission module as claimed in claim 15, wherein
the multiplexing device regards the input signal which is applied to the signal input of the transmission module as a programming signal when its signal level is
10 greater than or less than a predetermined threshold level.

17. The optical transmission module as claimed in claim 16,
15 - wherein the level detector is arranged in a monitoring unit in the multiplexing device, and
- wherein the monitoring unit has a memory device which is used to store the result of the signal evaluation.

20 18. The optical transmission module as claimed in claim 17, wherein the memory device has a flipflop.

19. The optical transmission module as claimed in
25 claim 3,
- wherein the multiplexing device has a frequency detector, by means of which it measures the frequency range of the input signal at the signal input of the transmission module, and
30 - wherein the multiplexing device uses the frequency range to determine whether the input signal is a transmission signal for the transmission device or is a programming signal for the control device.

35 20. The optical transmission module as claimed in claim 19, wherein
the multiplexing device regards the input signal which is applied to the signal input of the transmission

module as a programming signal when its frequency range is outside the frequency range that is typical for transmission signals.

5 21. The optical transmission module as claimed in claim 3, wherein

- the multiplexing device has a code detector, by means of which it evaluates the code sequences of the input signal which is applied to the signal
10 input of the transmission module, and
- wherein the multiplexing device uses the code sequences which are found to determine whether this is a transmission signal or a programming
15 signal.

22. The optical transmission module as claimed in claim 21, wherein
the multiplexing device regards the input signal which is applied to the signal input of the transmission
20 module as a programming signal when its code sequences are not the same as typical or previously defined code sequences for transmission signals.